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Financial Structure and Economic Growth: A Non-Technical Survey

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The views expressed in this paper are those of the authors.
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Abstract

There is a large body of literature that studies the relationship between financial structure (that is, the degree to which the financial system is either market- or intermediary-based) and long-run economic growth. This paper gives a non-technical survey of that literature designed for a general audience. The literature suggests that financial structure does not explain differential growth rates across countries. What matters for growth is the overall level and quality of financial services. Therefore, the best way to examine the connection between financial structure and growth is not to study how markets and intermediaries can substitute for each other, but rather how markets and intermediaries complement one another.

JEL classification: F36, G00, G14, G21, O16, K22
Bank classification: Development economics; Economic models; Financial institutions; Financial markets; Financial services

Résumé

Il existe une abondante littérature au sujet de la relation entre la structure du système financier (la mesure dans laquelle celui-ci repose sur le marché ou sur les intermédiaires financiers) et la croissance économique à long terme. Les auteurs vulgarisent ici à l'intention d'un public non spécialiste les conclusions des chercheurs sur le sujet. Selon ces derniers, la structure financière n'explique pas l'écart de croissance entre les pays. Les facteurs déterminants sont la qualité et le niveau global de développement des services financiers. Par conséquent, la meilleure façon d'examiner la relation entre la structure financière et la croissance n'est pas d'étudier comment les marchés et les intermédiaires financiers peuvent se substituer les uns aux autres, mais plutôt comment ils se complètent.

Classification JEL : F36, G00, G14, G21, O16, K22
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1 Introduction

Many economists have extensively investigated the relationship between finance and growth, and found that financial development has a strong, positive impact on economic growth (see Levine 1997 for a survey of the literature on the finance-growth nexus). This raises an important question: does financial structure (that is, the degree to which the financial system of countries is intermediary- or market-based) matter for long-run economic growth? To address this question, economists and policy-makers have concentrated on the relative merits of intermediary- versus market-based financial systems. The debate is more than a century old and it commenced with reference to Germany and the United Kingdom in the late nineteenth and early twentieth centuries. Gerschenkron (1962) and Goldsmith (1969) argue that the intermediary-based system in Germany permitted a closer relationship between intermediaries and firms than was possible in the market-based system in the United Kingdom.[1] The debate eventually expanded to involve the United States as a prominent market-based economy, and Japan as a dominant intermediary-based system. In fact, a few years ago, it was asserted that Japan would surpass the United States as the world's leading economic power because of its intermediary-based financial system (e.g., see Porter 1992). This claim stems from the fact that close relationships between intermediaries and firms can increase the availability of capital to borrowing firms, with positive ramifications for economic growth. Despite Japan's recent economic problems, policy-makers and economists throughout the world still examine the comparative advantages of intermediary- versus market-based financial systems (e.g., see Allen and Gale 2000, Levine 2000, and Demirgüç-Kunt and Levine 2001).

This paper gives a brief non-technical summary of the literature that examines the relationship between financial structure and economic growth.[2] We analyze four competing

[1] See Levine (1997) for earlier references.

[2] This paper builds on Levine (2000), Beck et al. (2000), Allen and Gale (2000, 2001), and Demirgüç-Kunt and Levine (2001).

views of financial structure and growth: the intermediary-based view, the market-based view, the financial services view, and the law and finance view. The first two views suggest that financial markets and intermediaries are substitute sources of financial services, while the last two suggest that financial markets and intermediaries are complements in the provision of financial services.[3]

The intermediary-based view emphasizes the importance of intermediaries in identifying good projects, mobilizing resources, monitoring managers, and managing risk while stressing the deficiency of market-based economies. For example, it has been argued that financial intermediaries are effective at financing projects that are characterized by substantial asymmetric information (e.g., adverse selection and moral hazard), because intermediaries have developed expertise in distinguishing between "bad" and "good" borrowers. According to the intermediary-based view, intermediary-based systems, especially in countries at an early stage of economic development, are more effective at fostering growth than market-based financial systems.

The market-based view stresses the role of markets in diversifying and managing risks while arguing that financial intermediaries can extract information rents from firms. For example, some firms at a certain point of their life-cycle rely mostly on market financing: bond financing is found predominantly in mature and relatively safe firms (Petersen and Rajan 1994, Bolton and Freixas 2000). Financing through financial markets (bond and stock markets) is particularly good for industries faced with continuous technological advances (Allen and Gale 1999, 2000), and where the information is sparse and diversity of opinion persists. In the view of proponents of markets, market-oriented systems are superior to intermediary-based systems in encouraging long-run economic growth.

Contrary to intermediary- and market-based views, the financial services view suggests that financial intermediaries may provide complementary services to those provided by mar-

[3]This paper omits other important issues related to financial structure, such as financial stability and regulation of financial systems. For further discussion, see Lai (2002) and Allen and Gale (2001).

kets. The primary emphasis behind this view is the importance of the overall level and quality of financial services rather than the channels through which those services are provided. The issue is not intermediaries *versus* markets, but rather the creation of an environment for better-functioning intermediaries *and* markets. Thus, the separation between markets and intermediaries in providing financial services is of secondary importance (Levine 1997, 2000).

The law and finance view is an extension of the financial services view and it has been put forward by Laporta et al. (1997, 1998, 1999). This view emphasizes that it is not the debate between intermediary- and market-based systems that really matters, but rather the legal environment and the enforcement of contracts. Hence, Laporta et al. reject the intermediary- versus market-based distinction and emphasize instead that the legal system plays the crucial role in determining the growth-stimulating nature of financial services.

Many economists have empirically investigated these views of financial structure and long-run economic growth. Goldsmith (1969) pioneered this work with a careful comparison of Germany and the United Kingdom. Recently, Levine (2000) and Demirgüç-Kunt and Levine (2001) have examined the same question by using a broad data set covering 48 countries from 1980 to 1993, finding that the distinction between intermediary- and market-based systems is not important for explaining the finance-growth nexus. Rather, elements of a country's legal system and the quality of its financial services are most important for fostering economic growth. In other words, they find strong support for the financial services view and the law and finance view, but they reject the market- and intermediary-based views. In contrast, Tadesse (2001) does find that the difference between intermediary- and market-based financial systems is important for explaining economic growth. For countries with underdeveloped financial sectors, intermediary-based systems outperform market-based systems, while for countries with developed financial sectors, market-based systems outperform intermediary-based systems. In contrast, Levine and Zervos (1998) argue that higher

stock market liquidity, irrespective of the development of banks (or greater bank development irrespective of the development of stock markets), leads to higher growth.

Although conclusions must be formulated cautiously, our survey of the literature suggests that there is strong evidence that financial structure—the mixture of financial markets and intermediaries—is not important for explaining differential growth rates across countries. Countries do not grow faster, and firms' access to finance is not systematically easier in either market- or intermediary-based systems. For example, Germany and Japan—major intermediary-based systems—and the United States and United Kingdom—the foremost market-based systems—have had different financial systems, but they have had similar growth rates over time. This might imply that the most important factor is that a sound legal system effectively protects the rights of investors and enforces contracts efficiently. This in turn would improve the operations of financial markets and intermediaries, with positive implications for long-run growth. This conclusion is consistent with the broad empirical analysis of financial structure and economic growth by Demirgüç-Kunt and Levine (2001, 12): "Through a diverse set of analyses, the answers are surprisingly clear . . . Overall financial development matters for economic success, but financial structure per se does not seem to matter much."

This suggests an important policy message: policy-makers should focus on legal, regulatory, and other policy reforms that encourage the proper functioning of both markets *and* intermediaries, rather than concern themselves with the degree to which their national financial system is market- or intermediary-based.

This paper is organized as follows. Section 2 briefly explains how the financial system affects economic growth. In section 3 we concentrate on the relationship between financial structure and growth. We first focus our attention on financial intermediaries and markets and how they facilitate savings mobilization, information acquisition, and risk management. Then we discuss whether intermediary- and market-based systems are substitutes for achiev-

ing long-run economic growth. Following this, we examine the financial services view and the law and finance view, where financial intermediaries and markets are described as two complementary sources of financial services. In section 4 we conclude by addressing some specific issues of concern and provide some policy advice. Section 5 recommends articles and books for further reading. Appendix A comments briefly on the relationship between financial structure and financial stability. Appendix B defines the key terms used in this paper.

2 Financial System and Growth

Before we study the link between financial structure and economic growth, it is important to briefly explain that financial systems affect growth. It should, however, be noted that the main focus of this paper is not to analyze the relationship between *financial systems and growth*, but rather to study *financial structure* and its relationship to growth. An extensive survey of the literature on the finance-growth nexus is provided by Levine (1997).

A primary function of financial systems (financial markets and intermediaries) is to move funds from people who save to people who have productive investment opportunities. This primary function can be separated into three basic subfunctions: the mobilization of savings, the acquisition of information, and the management of risk. By fulfilling these functions, financial systems improve both the quantity and quality of real investments and thereby increase income per capita and raise the standard of living. Levine (1997), in his broad review of the literature, finds that financial development has a significant positive impact on economic growth.

There are three major channels through which the financial system can promote growth (e.g., see Pagano 1993 and Levine 1997). First, the provision of financial services can encourage the mobilization of savings from many disparate savers. Financial systems affect growth by improving the efficiency with which those savings are used and increasing the amount of

funds allocated to firms, thereby facilitating the growth of capital and productivity. That is, financial systems can raise firm investment by reducing liquidity risk and idiosyncratic risk. Moreover, financial systems, by mitigating risk (particularly liquidity risk), affect positively economic growth, since they eliminate the premature liquidation of firm capital.

Second, better screening and monitoring of borrowers can lead to more efficient resource allocation. For instance, well-developed stock markets enhance corporate control by (i) aligning the interests of managers with those of firm owners, and (ii) facilitating takeovers to mitigate the principal-agent problem and so encourage economic growth. Furthermore, financial intermediaries can promote growth by economizing on the costs of gathering information by replacing many monitors with one delegated monitor.

Third, improvements in risk-sharing can enhance savings rates and promote innovative, high-quality projects. For example, stock markets reduce liquidity risk by allowing agents who receive liquidity shocks to readily and cheaply sell their shares in firms. Similarly, financial intermediaries, particularly banks, mitigate liquidity risk by issuing demand deposits and by pooling savings of individuals.

In sum, financial development (that is, the development of well-functioning financial markets and intermediaries) has a positive impact on long-run economic growth. This conclusion is supported by the cross-country studies. firm-level analyses, industry-level estimations, and time-series approaches surveyed by Levine (1997).

3 Financial Structure and Growth

So far, we have discussed the argument that financial systems affect long-run economic growth. In this section, we examine whether the *specific organization* of the financial system—that is, financial structure (the mixture of financial markets and intermediaries)—matters for growth. In particular, we investigate whether a market-based financial system is more growth-promoting than an intermediary-based system (and vice versa), or whether it is

the combination of both types of system that most affects long-run growth. To do so, we first explain how financial intermediaries and markets (i) aid savings mobilization, (ii) evaluate investment opportunities and exert corporate control, and (iii) facilitate risk management. In other words, we first focus on *how* rather than *how well* financial intermediaries and markets provide financial services, and only thereafter do we examine the key issue of the paper: the relative contribution to economic performance by market- and intermediary-based systems.

3.1 The provision of financial services by intermediaries

This subsection describes the literature on how financial intermediaries provide financial services that enhance economic performance.

Savings mobilization and allocation: Financial intermediaries boost the mobilization of savings in at least two ways. First, they lower transactions costs associated with collecting savings from numerous individuals in the economy. Second, financial intermediaries mitigate the moral hazard and adverse selection problems that make individuals less willing to relinquish control of their savings. By alleviating the asymmetric information problems and by reducing transactions costs, financial intermediaries ease savings mobilization and thereby increase economic growth. The channels through which financial intermediaries encourage long-run growth are as follows: (i) by mobilizing savings, financial intermediaries increase capital formation, which in turn increases the national savings rate, and (ii) by exploiting economies of scale, thereby reducing transactions costs per unit of transactions as the size of a transaction increases, financial intermediaries improve the allocation of savings.

Information acquisition: When borrowers have private information about the quality of their projects ex ante (adverse selection), screening by the intermediary is essential to provide agents with incentives to accurately report whether the project is bad or good. Without screening, "bad" borrowers may pretend to be "good," and this may lead to underinvestment

in good projects, since lenders cannot observe the true type of borrowers. Indeed, screening has played a major part in developing theories of credit rationing (e.g., see Stiglitz and Weiss 1981). Because it is costly to screen projects, it is optimal to delegate the acquisition of information to intermediaries to avoid the duplication of costly information acquisition (e.g., see Boyd and Prescott 1986).

Furthermore, when borrowers have private information regarding the realization of projects (moral hazard), state verification or monitoring by the intermediary is necessary to provide incentives to agents to truthfully report the outcome of the projects. Failure to do so may result in a lower return to the lender. Since it is costly to assess the actual state (costly state verification), it is more efficient to have only one agent do the assessment for a group of agents (Townsend 1979, Diamond 1984, Williamson 1987, Bernanke and Gertler 1989, and Thadder 1995). For example, in his seminal work, Diamond (1984) shows that the costs of monitoring decline as the intermediary deals with an increasing number of borrowers. In other words, financial intermediaries exploit economies of scale in the monitoring of firms.

Moreover, financial intermediaries can mitigate the so-called *free-rider problem* in the private production of information. The free-rider problem emerges when individuals who do not pay for information take advantage of the information that other individuals have paid for. A direct consequence of the free-rider problem is that it prevents the private market from producing enough information to eliminate the asymmetric information that leads to adverse selection and moral hazard. Consider this example (Mishkin 1995, 214):

> [S]uppose that you have just purchased information that tells you which firms are good and which are bad. You believe that this purchase is worthwhile because you make up the costs of acquiring this information, and then some, by purchasing the securities of good firms that are undervalued. However, when our savvy (free-riding) investor Irving sees you buying certain securities, he buys right along with you, even though he has not paid for any information. If many other investors act as Irving does, the increased demand for the undervalued good

securities will cause their low price to be bid up immediately to reflect the securities' true value. As a result of all these free riders, you can no longer buy the securities for less than their true value. Now that you will not gain any extra profits from purchasing the information, you realize that you never should have paid for this information in the first place. If other investors come to the same realization, private firms and individuals may not be able to sell enough of this information to make it worth their while to gather and produce it. The weakened ability of private firms to profit from selling information will mean that less information is produced in the marketplace.

Financial intermediaries, particularly banks, can avoid the free-rider problem by making primarily private loans rather than purchasing securities that are traded in the open market. Because private loans are not traded, no one can free-ride on the intermediary that is monitoring and screening projects. As a result, financial intermediaries have greater incentives to acquire the costly information.

By reducing duplication and free-riding, financial intermediaries improve the ex ante assessment of investment opportunities (screening) and the ex post exertion of corporate control once those investments have been funded (and so address the principal-agent problem). This, in turn, improves capital allocation and boosts economic growth.

Risk management: Financial intermediaries may facilitate risk-sharing by reducing transactions costs. Standard risk-diversification arguments concentrate primarily on *cross-sectional risk-sharing*, which requires that individuals, at a given point in time, diversify their portfolio of assets. If there are fixed costs associated with each transaction of assets, financial intermediaries, by taking advantage of economies of scale, can reduce the costs of holding a diversified portfolio of assets.

Furthermore, intermediaries may ease the *intertemporal smoothing* of risks that cannot be diversified at a given point in time, such as oil-price shocks and other macroeconomic shocks,

by averaging those shocks over time in a way that decreases their adverse effects on welfare (Allen and Gale 1997 and Levine 2000). Intertemporal risk-smoothing requires that investors accept lower returns than what the market offers in some period (particularly in good times), to get higher returns relative to the ones offered by markets in other periods (especially during recessions). Financial intermediaries are well suited to provide intertemporal risk-sharing, because it requires the accumulation of large reserves in safe assets. Markets are unable to provide this insurance since, in markets, investors *continually* adjust their portfolios to earn the highest rate of return (the arbitrage opportunity).

Such intertemporal risk-sharing can be illustrated by the sharp increase in oil prices in the early 1970s, and by the stock market boom in the 1980s. In the former case, given that claims on intermediaries were constant in value, households in Japan and Germany (both intermediary-based systems) did not experience a decline in wealth like those in the United States and the United Kingdom, and as a result they did not face substantial fluctuations in their consumption. Thus, intermediary-based financial systems were able to smooth the oil-price shock rather than pass it on to households. In the boom of the 1980s, however, households in the United States and United Kingdom (who have most of their wealth in stock markets) obtained higher returns and used those returns to finance a higher consumption profile. German and Japanese households, on the other hand, did not gain as much from the boom, since their savings were mostly in intermediaries, where they were promised fixed returns.[4]

This example shows that financial systems, where bank deposits represent a large fraction of total wealth, can protect households from swings in the value of assets resulting from aggregate shocks. Obviously, households in the United States and United Kingdom can hold bank deposits, but the returns are not as high. In fact, Allen and Gale (2000, 155) argue that "the problem is that intermediaries in market-based systems have to compete with

[4]A natural question here is, how important are cross-sectional versus intertemporal risk-sharing empirically? More broadly, what is the importance of different mechanisms of risk-sharing (such as the insurance provided by government)? This is left for future research.

financial markets, and competition from markets may prevent intermediaries from providing risk smoothing to households. In other words, either intermediaries have to pass on risks to households or they have to hold safer assets, which earn lower returns."

Intermediaries can also mitigate liquidity risk (Diamond and Dybvig 1983, Bencivenga and Smith 1991, and Holmström and Tirole 1998). Many high-return investments require a long-term commitment of capital, but risk-averse agents are generally hesitant to relinquish control of their savings for extended periods. Financial intermediaries, however, make long-term investments more desirable, since they pool savings, which can be made liquid whenever needed. More precisely, financial intermediaries invest just enough in short-term assets to satisfy those with liquidity needs and at the same time make a long-run commitment of capital to firms. By facilitating start-up of high-return investments, financial intermediaries improve the allocation of capital and thereby encourage economic growth.

Intermediaries, particularly banks, may be more effective at providing external finance to new firms that require staged finance, because intermediaries can more *credibly* commit to making additional funding available as the project develops, while markets have a more difficult time making credible long-term commitments. To put it differently, since it is easier to renegotiate bank loans than to restructure corporate bonds, intermediaries may have a comparative advantage (Lummer and McConnell 1989 and Gilson, Kose, and Lang 1990). Financial markets (bond and equity) are not very effective at providing pre-committed stage financing, because with publicly traded securities it is generally not possible to design a mechanism where the owners of the securities act *collectively* to determine whether additional funds should be provided. Thus, financial intermediaries would encourage the start-up of innovative projects and long-run economic growth.

This variety of theories illustrates how and why well-developed intermediaries provide growth-promoting financial services.

3.2 The provision of financial services by markets

Parallel to the literature on financial intermediaries, there is also an extensive literature on how financial markets provide financial services by affecting savings mobilization, information acquisition, corporate control, and risk management with positive ramifications for growth.

Savings mobilization and allocation: Well-developed financial markets can also facilitate savings mobilization. As noted above, transactions costs and asymmetric information (adverse selection and moral hazard) make the mobilization of savings costly. For example, in the presence of asymmetric information, risk-averse agents do not feel comfortable entrusting their savings to others. Because transactions and information costs are associated with collecting savings from many disparate agents, financial markets emerge to ameliorate these frictions and ease savings mobilization. Characteristic of well-functioning markets is the necessity for efficient information-disclosure procedures, contracting systems, and accounting standards. For example, in market-based systems, such as the United States, a substantial number of firms are publicly listed and face extensive disclosure requirements. This implies that a great deal of information is revealed and, as a result, difficulties associated with savings mobilization are lowered. Another way in which financial markets ease savings mobilization is the desire of "market-makers" (that are multiperiod players) to build up their reputation. Reputation acts as a commitment device enabling market-makers (dealers) to *properly* manage the savings of agents. This provides individuals with incentives to entrust their savings through market-makers, and thereby encourages savings mobilization (e.g., see Diamond 1991, Chemmanur and Fulghieri 1994, and Levine 2000). In sum, financial markets that are more effective at pooling or mobilizing savings from several agents can have strong positive effects on economic development by boosting capital formation and by improving resource allocation.

Information acquisition: Well-developed financial markets may encourage information gathering and processing. Since individual investors can achieve high returns by trading information in well-functioning markets, they are willing to devote greater resources in researching innovative projects. Allen and Gale (2000) carefully explain this idea by arguing that new technologies are hard to assess either because little information is available about their potential returns or because the information itself is difficult to judge without some expertise. The wide range of possibilities and the lack of hard data mean that there is often substantial *diversity of opinion.* Investors who can potentially finance these new technologies have different views on the outcomes and *agree to disagree.* Financial markets have considerable advantages in such situations. They involve many people participating directly in the decision-making process. This is obviously costly, since they have to acquire information to make the decision, but it has the merit that everybody can contribute or withhold their money according to their own views. This flexibility implies that at least some innovative projects are likely to be financed. Consequently, the development of new technologies and the improved information about firms enhance resource allocation substantially, with corresponding ramifications for long-run economic growth.

In addition to affecting the acquisition of information before financing projects, well-developed financial markets can assist corporate control after funding has taken place. Markets induce better corporate control (i) by facilitating hostile takeovers and (ii) by structuring compensation such that managerial compensation is conditioned on firms' performance. Well-developed markets ease takeovers so that outsiders can buy poorly managed firms, fire managers, and transform the firm into a more productive enterprise. Likewise, well-functioning financial markets allow managerial compensation to be attached to stock price performance, which in turn helps to align the interest of managers with those of firm owners (Holmström and Tirole 1993).

Risk management: Well-developed financial markets facilitate risk diversification and enhance the ability to avoid liquidity risk. Financial markets are well suited to achieve cross-sectional risk-sharing, where individuals are able to build the most *suitable* portfolio of assets. Cross-sectional risk-sharing requires the availability of numerous financial assets. Markets are able to provide such insurance since market-based systems are characterized by the existence of a vast array of financial products. Another advantage of markets is that they probably reduce the number of middlemen necessary when agents build their portfolio.

Moreover, financial markets can reduce liquidity risk with positive impacts on long-run growth (Levine 1991, 2000). The intuition behind this idea is that, in general, most high-return projects are long-term investments. As a result, funds have to be committed to the projects for long periods. Individual investors, however, are often reluctant to give up control of their savings for extended periods. Liquid financial markets encourage the start of long-term investments, since they allow savers to sell securities readily without any discounting if they need to access their savings. At the same time, capital raised through security issues allows firms to enjoy continuing access to capital. Therefore, by boosting long-term and high-return investments, liquid markets create an efficient allocation of capital, which in turn promotes economic growth.

In sections 3.3 and 3.4, we examine the four competing views of financial structure and economic growth based on the characteristics and benefits of markets and intermediaries described above.

3.3 Intermediary- and market-based views

In the previous sections we examined the means through which financial intermediaries and markets facilitate the mobilization of savings, ease information acquisition, and aid risk management. We have not, however, determined the relative contributions of intermediaries and financial markets in promoting long-run economic growth. In this section we describe

how the literature examines whether intermediary- and market-based systems are substitutes in the provision of financial services that stimulate economic growth.

Intermediary-based view: As discussed above, financial intermediaries ease the mobilization of savings, acquire and disseminate costly information, and facilitate risk management. These financial services are crucial for the efficient allocation of capital to firms, thereby encouraging long-run economic growth. Given this ability of intermediaries to promote economic development, the intermediary-based view represents mainly a critique of the role of financial markets in the provision of growth-promoting financial services (Levine 1997, 2000).

In particular, advocates of the intermediary-based view argue that well-functioning markets instantly reveal information in public markets, which provides individual investors with less incentive to acquire information. This argument is primarily based on the well-known free-rider problem described earlier. If information is going to be revealed by the market, no one has an incentive to collect it. As a result, competitive financial markets may be characterized by underinvestment in information. Consequently, well-developed markets have a negative impact on the identification of innovative projects and thereby impede efficient resource allocation (Stiglitz 1985 and Boot, Greenbaum, and Thakor 1993). Financial intermediaries may have better incentives to gather information and monitor firms and can efficiently internalize the fixed cost of doing so. The free-rider problem is less severe in intermediary-based systems, since banks can make investments without revealing their actions instantaneously in public markets.

Advocates of the intermediary-based view also underscore the fact that liquid markets can create an environment in which individual investors behave as if they were myopic (Bhide 1993). Specifically, because individual investors are able to readily sell their shares in liquid markets, they have fewer incentives to monitor managers thoroughly. This implies that greater market development may hinder corporate control and economic performance.

Another argument that financial markets are not well suited for corporate control is that insiders have better information about the firms than outsiders do. This informational asymmetry moderates the potential effectiveness of takeovers, given that it is more likely that well-informed insiders will outbid less-informed outsiders.

Moreover, the intermediary-based view argues that while markets can potentially provide the best-customized products for diversifying risk, they are unable to diversify aggregate shocks because, for a number of reasons, markets are incomplete. One class of reasons concerns informational asymmetries and related problems (e.g., adverse selection and moral hazard): contracts for the delivery of the financial services can be contingent only on states whose occurrence can be verified to the satisfaction of all counterparties. Another class of reasons stems from transactions costs: the time and money spent in carrying out financial transactions are a major impediment in the development of markets. Yet another class of reasons comes from enforceability constraints: a promise to deliver one unit of financial service is worthless if delivery cannot be enforced. This incompleteness of markets gives rise to the development of institutions such as financial intermediaries that can take the place of "missing markets." Therefore, in some cases—particularly those involving intertemporal risk-sharing, which averages aggregate risks over time through the accumulation of reserves in safe assets—intermediary-based systems may offer better risk-ameliorating services than market-oriented systems (Allen and Gale 1997).

Furthermore, it has been argued that intermediaries have advantages over markets in most institutional environments. More precisely, even in countries with weak legal and accounting systems, powerful intermediaries can still make firms reveal information and pay back their debts, thereby facilitating expansion and long-run growth (Rajan and Zingales 1999).

In sum, the intermediary-based view predicts that intermediary-based systems are more growth-promoting than market-based systems.

Market-based view: The market-based view essentially counterattacks the intermediary-based view by concentrating on problems generated by powerful banks.

First, in the process of financing firms, financial intermediaries get access to information that is not available to other lenders. Intermediaries can use such inside information to extract rents from firms. More concretely, at the time of new investments or debt renegotiations, intermediaries, particularly banks, can have bargaining power over a firm's expected future profits. Powerful intermediaries can obtain a disproportionately large share of the profits, so that firms will have fewer incentives to undertake high-risk and profitable projects (Rajan 1992).

Second, when intermediaries enter in a debt contract with firms, they have a natural bias towards low-risk projects that have a high probability of success. The drawback of this behaviour, however, is that low-risk projects are generally low-return investments. Therefore, intermediary-based systems can curtail technological innovation and long-run economic growth. Weinstein and Yafeh (1998) have found evidence in Japan that supports these two points. They show that, while close relationships between intermediaries and firms increase the availability of capital to borrowing firms, they do not necessarily lead to profitability or growth. In fact, the cost of capital for firms with close intermediary ties is higher than that of their peers, which suggests that most of the benefits from these relationships are appropriated by intermediaries. The slow growth rates of intermediary clients also indicates that intermediaries discourage firms from investing in risky but profitable projects.

Third, powerful intermediaries can collude with managers against outsiders, which in turn impedes competition, corporate control, the creation of new firms, and thus long-run economic growth (Hellwig 1998). Wenger and Kaserer (1998) provide evidence from Germany where intermediaries, particularly banks, misrepresent the balance sheets of firms to the public and encourage firm managers to misbehave.

Fourth, Allen and Gale (1999) argue that, although intermediaries can be effective at

eliminating duplication of information gathering and processing, they can have less success dealing with uncertainty, innovation, and new ideas. For example, the assessment of new technologies is hard either because little information is available about their potential returns or because the information itself is difficult to judge without some expertise. The wide range of possibilities and the lack of hard data mean that there is often substantial diversity of opinion. Intermediated financing requires delegation of the decision regarding the financing of a project to a relatively small number of decision-makers. When there is no disagreement, this kind of delegation is very effective and can imply substantial cost savings. A problem, however, exists when diversity of opinion persists. Although managers do everything they possibly can to choose projects they believe are worthwhile (i.e., abstracting from the principal-agent problem), *diversity of opinion* suggests that some of the providers of funds would disagree with those decisions. If the likelihood of disagreement is high enough, investors may have fewer incentives to supply funds. Consequently, intermediated finance implies the underfunding of new technologies. As argued in section 3.2, because markets allow individuals to agree to disagree, and therefore allow coalitions of people with similar views to join together to finance projects, markets are very effective at financing industries that are new, or where relatively no relevant data are created; that is, industries in which little information is available and a diversity of opinion perseveres.[5]

Fifth, market-based systems have a comparative advantage in providing cross-sectional risk-sharing (i.e., diversification of risk at a given point in time). Markets are well suited to achieving cross-sectional risk-sharing because of the enormous variety of financial products available in market-based financial systems.[6]

[5]A good example of a new industry where very little information was initially available is biotechnology. Given the lack of similar existing industries, it was very unclear which strategies were the best to use. This led to great diversity of opinion. Neverthless, this industry has been successfully funded through financial markets, particularly the stock market.

[6]For example, Allen and Gale (1995) present evidence (Table 4, 188) that compares Germany, a major intermediary-based system, and the United States, a dominant market-based economy. They conclude that "Germany has a system where the range of instruments available to investors is controlled by few banks and is *limited*. In contrast, in the United States competitive financial markets ensure investors have a *wide* range

In light of the above arguments, proponents of the market-based view stress that market-based systems encourage growth more than intermediary-based systems.

In sum, advocates of both market- and intermediary-based financial systems argue that financial markets and intermediaries are substitutes in fostering long-run economic growth. This conclusion has been supported by a number of empirical analyses. For example, in a study of 36 countries from 1980-1995, Tadesse (2001) finds that the difference between intermediary- and market-based financial systems is important in explaining economic growth. For countries with underdeveloped financial sectors, intermediary-based systems outperform market-based systems, while for countries with developed financial sectors, market-based systems outperform intermediary-based systems. In contrast, Levine and Zervos (1998) show that higher stock market liquidity or greater bank development leads to higher growth, *irrespective* of the development of the other. Findings by Arestis, Demetriades, and Luintel (2001) suggest that intermediary-based financial systems may be more growth-promoting than market-based financial systems. In their study, they use time-series methods, rather than cross-country growth regressions, and show that while stock markets in five developed countries (Germany, United States, Japan, United Kingdom, and France) may be able to contribute to long-run output growth, the influence of the stock market is much smaller than that of banks. Using data from 44 countries, Demirgüç-Kunt and Levine (1996) show that countries with a well-developed stock market also have well-developed banks and non-bank financial intermediaries. This suggests that markets and intermediaries are complements in providing growth-promoting financial services. We analyze this possibility in section 3.4.

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of instruments available."

3.4 Financial services and law and finance views

The financial services view and the law and finance view argue that intermediaries and markets are complements in the provision of growth-enhancing financial services.

Financial services view: In section 3.3 we described the view that financial markets and intermediaries (financial systems) emerge to reduce transaction and information costs. In doing so, financial markets and intermediaries both provide key financial functions: savings mobilization, information acquisition, and risk management. The financial services view focuses on these functions and emphasizes the important role of a well-functioning financial system (both financial markets and intermediaries) in providing these services. Specifically, according to the financial services view, the central question is the overall quantity and quality of these financial services, and not the specific organization of the financial system (market- or intermediary-based). In other words, the issue of market- *versus* intermediary-based systems is of secondary importance.

The financial services view argues that markets and intermediaries are alternatives that perform more or less the same functions but in different ways and possibly with different degrees of success (Boyd and Smith 1996 and Allen and Gale 1999). For example, by encouraging competition for corporate control and by creating alternative ways of funding investment opportunities, financial markets mitigate the adverse effects of powerful intermediaries. Rajan (1992) shows that "the firm's choice of borrowing sources (bank and bond finances) and the choice of priority for its debt claims attempt to optimally circumscribe the powers of banks." Besanko and Kanatas (1993) characterize an economy in which bank and (bond) market finances coexist such that the market reduces the incentive of the bank to excessively monitor the firm.[7] Another argument put forward in favour of the complementar-

[7]Bolton and Freixas (2000) propose a model of financial markets and corporate finance, with asymmetric information where equity issues, bank debt, and bond financing coexist in equilibrium. For more on the theoretical literature concerned with the coexistence of bank lending and bond financing, see Boot and Thakor (1997), Holmström and Tirole (1997), and Repullo and Suarez (2000).

ity of financial services provided by markets and intermediaries is that both intermediaries and markets have a comparative advantage at dealing with different types of information. Intermediaries can benefit from increasing returns to scale in mitigating asymmetric information, but may be unsuccessful when dealing with uncertainty, innovation, and new ideas. In contrast, markets may be more effective at financing industries that are new or where relatively little relevant data are generated; that is, industries in which information is sparse and diversity of opinion persists. Demirgüç-Kunt and Levine (1996) use firm-level data to show that increases in securities market development actually tend to increase the use of bank finance in developing countries. Thus, these two elements of the financial system may act as complements during the development process. It may be desirable to avoid viewing intermediary- and market-based systems as representing a trade-off. A careful empirical study by Levine (2000)—the first cross-country examination of financial structure and growth that uses a broad data set of countries—is strongly supportive of the financial services view. This prompts the following question: what conditions are necessary to provide better financial services? We address this question partially by discussing the legal system.

Law and finance view: The law and finance view (also called the legal-based view) is an extension of the financial services view. It is put forward by Laporta et al. (1997, 1998, 1999). They reject the debate centered on intermediary- *versus* market-based interpretations. Levine (2000), building on Laporta et al., argues that "creating strong legal systems that support the right of outside investors (both equity and debt investors) *and* then efficiently enforcing those codes is crucial for providing growth-enhancing financial services." Intuitively, this is a simple idea, since a promise to deliver one unit of financial services tomorrow is worthless if delivery cannot be enforced. As a result, the law and finance view conjectures that the overall financial development defined by the legal and regulatory systems predicts economic performance better than any measure of financial structure per se. In fact, Chakraborty and Ray (2001), in a model where financial structure arises endoge-

nously, show that it is entirely possible for two countries to have distinctly different financial systems but enjoy similar growth rates over time (as in the case of Germany and the United States.) This supports Levine's (2000) and Demirgüç-Kunt and Levine's (2001) empirical findings that the specific type of financial system is not important for explaining differential growth rates across nations. Their conclusion emerges from cross-country regressions, industry panel estimations, and firm-level analyses. They stress that elements of a country's characteristics and the quality of its financial services are more important for fostering long-run economic growth. In short, they find no support for the intermediary- and market-based views of financial structure and growth, but find strong support for the financial services view and legal-based view. Similarly, other evidence exists that financial markets and intermediaries are complements rather than substitutes. Demirgüç-Kunt and Levine (1996) show that countries with well-developed stock markets also have well-developed banks and non-bank financial intermediaries, while countries with weak stock markets tend to have weak banks and financial intermediaries.

4 Conclusion

In this paper we have presented a brief summary of the literature on the link between financial structure and long-run economic growth. We have explained how financial markets and intermediaries perform their functions and discussed the impact of these roles on growth. We have found that there is a rich diversity of opinion in the existing literature on the relationship between financial structure and growth. Advocates of the intermediary- and market-based views argue that financial intermediaries and markets are substitutes in promoting growth. Proponents of the financial services and law and finance views stress that intermediaries and markets are, in fact, complements in fostering economic performance.

Lessons: Investigating the link between financial structure and long-run growth is dif-

ficult and it is therefore not surprising that there are no straightforward conclusions. Our survey of the literature, however, suggests that there is more support for the financial services and the law and finance views. Thus, most researchers on this topic feel that financial intermediaries and markets are complements in the provision of growth-promoting financial services. Both market- and intermediary-based systems have their own comparative advantages: (i) financial markets are better at financing new technologies and projects where there is little agreement on how firms should be managed, while (ii) intermediaries are effective at mitigating moral hazard and adverse-selection problems that exist between lenders and borrowers. This is explained by the fact that intermediaries, particularly banks, have developed expertise to distinguish between bad and good projects.

Economies that have well-developed financial markets and intermediaries have an advantage. For example, financial markets, by providing an alternative source of financing, reduce the adverse effects of excessive intermediary power. Thus, financial structure (the degree to which the financial system of countries is intermediary- or market-based) is not important for explaining differential growth rates across economies. Countries do not grow faster, and firms' access to external finance is not systematically easier, in either market- or intermediary-based systems. For example, Allen and Gale (2000, 21) claim that "in the end, it is not a question of markets *versus* intermediaries, but rather of markets *and* intermediaries."[8]

Policy implication: Policy-makers should focus their attention on legal, regulatory, and other policy reforms that encourage the proper functioning of both markets *and* intermediaries, rather than concern themselves with the degree to which their national financial system is market- or intermediary-based.

[8]Although in this paper we do not examine the relationship between financial structure and financial stability, we argue in Appendix A that this relationship provides another reason for focusing on having both well-developed intermediaries *and* markets.

Future research: Despite all of the above work, the literature on financial structure is still at an early stage. Many questions remain, some of which are discussed below.

Current research at the Bank

- Would incompleteness of domestic markets have meaningful implications for the efficient allocation of savings and investment, and thus for growth? In particular, it would be interesting to look at implications for small- and medium-sized firms in Canada, since they have traditionally less access to foreign capital markets.

- It is well known that financial factors can be important in examining the effects of real and monetary shocks (Bernanke and Gertler 1989 and Carlstrom and Fuest 1997). Little is known, however, about whether the underlying structure of the financial system matters for the propagation mechanism of productivity and monetary shocks. Therefore, it would be interesting to investigate how real and monetary disturbances affect economies characterized by different financial structures (intermediary- or market-based).

Possible future research

- The conventional analysis of financial crises often stresses that country-specific factors, such as financial structure, are the main factors for these crises (Agénor, Miller, and Weber 1999, Corsetti and Roubini 1998a,b, Krugman 1998, and McKinnon and Pill 1997, 1999). Financial crises have occurred, however, both historically and recently, in many countries with rather different financial structures, implying that financial crisis is a more general phenomenon. Thus, it has been suggested that financial structure, whether intermediary- or market-based, is not the most important factor determining the development of financial crises (Allen 2000). On the other hand, Greenspan

(1999) argues that "multiple alternatives to transform an economy's savings into capital investment act as backup facilities should the primary form of intermediation fail." Given these opposing views, further research should focus on whether the specific organization of the financial system matters for the possible occurrence of financial crises. Furthermore, this research should address what actions central banks must take to prevent financial crisis and thereby promote financial stability.

- Another area of future research could be to investigate the effects of different financial systems on the performance and growth of firms, macroeconomic aggregates, and welfare in a micro-based general-equilibrium model. Since no country has a purely market- or intermediary-based system, no empirical evidence on such benchmark economies can be found. Thus, theoretical research on a micro-based general-equilibrium model environment might be useful.

- Why do countries with similar levels of economic development (the United States and Germany) differ in their financial structure? Is it a historical accident, or are there some fundamental differences (technologies, endowments, property rights, etc.) between these countries?

- It is often argued that one of the main advantages of intermediary-based systems is the possibility of an intermediary-firm long-term relationship. What is the importance of this long-term relationship empirically?

- What is the empirical evidence of the relationships between financial structure and capital accumulation or technology innovation?

- What is the empirical relationship between the concentration of ownership of financial assets and financial structure?

5 Recommended Reading

For more details and to further your understanding, we suggest the following articles and books:

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Appendix A: Financial Stability and Financial Structure

Although in this paper we do not examine the relationship between financial structure and financial stability, we argue that this relationship provides another reason for focusing on having both well-developed intermediaries *and* markets. In the event of a crisis in one system, the other system can perform the function of the "spare wheel." Greenspan (1999, 1) advocates this view and persuasively argues that:

> What we perceived in the United States in 1998 may reflect an important general principle: multiple alternatives to transform an economy's savings into capital investment act as backup facilities should the primary form of intermediation fail. In 1998 in the United States, banking replaced the capital markets. Far more often it has been the other way around, as it was most recently in the United States a decade ago. When American banks stopped lending in 1990, as a consequence of a collapse in the value of real estate collateral, the capital markets were able to substitute for the loss of bank financial intermediation. Interestingly, the then recently developed mortgage-backed securities market kept residential mortgage credit flowing, which in prior years would have contracted sharply. Arguably, without the capital market backing, the mild recession of 1991 could have been far more severe.

Appendix B: Definitions

Adverse selection: An asymmetric information problem that occurs *before* the transaction takes place: potential bad credit risks are those who most actively seek out loans. Thus, the parties who are the most likely to produce an undesirable outcome are most likely to want to engage in the transaction.

Asymmetric information: A situation where one agent has insufficient knowledge about the other agent involved in a transaction, thus preventing them from making appropriate decisions.

Cross-sectional risk-sharing: Cross-sectional risk-sharing involves spreading risks across a broad section of individuals so that each individual holds a relatively small share of the risk (i.e., individuals hold a diversified portfolio of assets).

Financial intermediaries: Financial intermediaries include banks, trust companies, credit unions, caisses populaires, life insurance companies, mutual funds, private pension funds, and others. In this paper we use the standard definition of financial intermediaries as commonly used in the literature. Because of the blurring of the boundaries between financial markets and intermediaries, it is difficult to classify all types of financial institutions into two broad categories (markets and intermediaries).

Financial markets: Financial markets bring together agents demanding funds with those having surplus funds. Financial markets provide a mechanism through which the financial manager may obtain funds from a wide range of sources. Financial markets are composed of money markets and capital markets.

Financial services view: The financial services view points out that financial intermediaries may provide complementary services to those provided by the markets. Moreover, this view focuses on the relationship between growth and the quality of the functions provided by the financial system. According to this view, the issue is not a market *or* intermediaries, rather markets *and* intermediaries.

Financial structure: Financial structure is the degree to which the financial system is either market- or intermediary-based.

Financial system: A financial system is composed of three main components: financial markets, financial intermediaries, and clearing and settlement systems.

Free-rider problem: The free-rider problem emerges when individuals who do not pay for information take advantage of the information that other individuals have paid for.

Idiosyncratic risk: Idiosyncratic risk is also referred to as non-systematic risk. This is risk associated with a class of projects where the variations in results are particular to the individual project, and have low correlation with each other. This is in contrast to systematic risk or systemic risk, where similar factors affect all projects, and the correlation between individual outcomes is high.

Intermediary-based (or Bank-based) view: The intermediary-based view emphasizes the importance of intermediaries in identifying good projects, mobilizing resources, monitoring managers, and managing risk while stressing the deficiency of market-based economies. This view predicts that intermediary-based financial systems are more growth-fostering than market-based systems.

Intertemporal risk-sharing: Intertemporal risk-sharing consists of averaging non-diversifiable macroeconomic shocks over time. This kind of risk-sharing requires the accumulation of a large reserve in safe assets. Intermediaries are able to provide this insurance. In markets, individuals are constantly adjusting their portfolio to get the highest returns. This impedes the accumulation of reserves in safe and low-return assets. Therefore, markets are unable to provide intertemporal risk-sharing.

Law and finance view: The law and finance view emphasizes the role of the legal system in determining growth-promoting financial services. This is an extension of the financial services view.

Liquidity risk: Liquidity risk arises because of the uncertainty associated with converting assets into an exchangeable medium. Most high-return projects require a long-term commitment, but risk-averse agents do not like to give up control of their savings for lengthy periods.

Market-based view: The market-based view highlights the importance of markets in identifying good projects, mobilizing resources, monitoring managers, and managing risk, while stressing the deficiency of intermediary-based economies. This view holds that market-based systems are more growth-promoting than intermediary-based systems.

Moral hazard: This type of asymmetric information problem arises *after* the transaction takes place: the lender runs the risk that the borrower will secretly engage in higher-risk activities than negotiated, which makes it less likely that the loan will be repaid.

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